Operating and Installation instructions

Control Unit

Type GRANUDOS Touch

Operating instructions Part 2: for control unit “Touch”

Part 2, for operating instructions for dosing device:

- **Granudos 10 Touch, No.: OI SW 002**
- **Granudos 45/100 Touch, No.: OI SW 003**

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1 About these instructions / general

1.1 Scope of applicability

This manual describes the function, Installation, commissioning and operation of the device. Read these operating instructions carefully prior to operating the device and keep them in close proximity to the device for immediate use!

1.2 Target group

Only our authorised partners and people who have been trained in the functioning of the device are permitted to work on the device, provided that they have read and understood these Operating Instructions.
Electrical connection work may only be carried out by appropriately trained specialists!

1.3 Symbols used

This document uses the following types of safety notices as well as general notices:

DANGER!
"DANGER" denotes a safety notice which, if disregarded, may lead to **serious** or **life-threatening injuries,** or **serious material damage**!

CAUTION!
"CAREFUL" denotes a safety notice which, if disregarded, may lead to **injuries, damage to health** or **material damage**!

ATTENTION!
"ATTENTION" denotes a safety notice which, if disregarded, may lead to **material damage**!

CORROSIVE!
"Corrosive" denotes a safety notice which, if disregarded when handling chemicals, may lead to **injuries** or **material damage**.

ESD SENSITIVE!
"ESD SENSITIVE" denotes electronic components that may be damaged by electrostatic discharges. The generally accepted safety precautions for ESD-sensitive devices must be observed when handling the devices!

NOTICE!
A notice denotes information which, if disregarded, may lead to **malfunctions**.

Tip!
A "Tip" denotes information that may result in **improvements in the operating process**.

Mandatory sign
Use face shield!

Mandatory sign
Use protective gloves! In accordance with DIN EN 374, protective gloves against chemicals and microorganisms

Mandatory sign
Use protective apron!

Mandatory sign
Use protective boots!

1.4 Warranty

All WDT devices and equipment are manufactured using modern production methods and are subject to comprehensive quality control. However, should there be a reason for complaint, any compensation claims shall be directed to the company WDT in accordance with the general terms and conditions of warranty (see below).

General terms and conditions of warranty
The Co. WDT assumes a 2-year warranty, starting with the commissioning, up to 27 months after delivery; subject to correct installation and commissioning with a completed and signed commissioning protocol.
Exempt from this are wear parts such as gaskets, hoses, membranes, dosing screws, electrodes, roller supports and other parts that are subject to mechanical or chemical wear and tear. For these we assume a warranty of 1/2 year.
Our merchandise management programme requires an invoice for each delivery (including warranty services). When returning a defective component, upon review you will receive a corresponding credit, if applicable. We request a return within 14 days.
The costs for subsequent damages and for the processing of warranty claims are excluded.
There are no warranty claims for damages caused by frost, water and electrical overvoltage or by improper handling.

Tip!
In order to protect the warranty claims, please mail the completed commissioning protocol, along with the defective component, to the Co. WDT. Without the commissioning protocol, we reserve the right to assert a warranty regulation.

CAUTION!
It is not permitted to make any modifications to the device. If this specification is not observed, the warranty obligation and product liability will expire!

1.5 Further information

Further information about special topics, e.g., design of the dosing performance or description of the operating parameters, is available from your specialist supplier.

1.6 Information regarding support queries

The GRANUDOS Touch series is a highly sophisticated electronic control unit. It is subject to continued further development of both its firmware and hardware. We always strive to preserve the compatibility of the components used, but we are unable to guarantee this over a period of several years!

For spare part orders, we therefore always require the following data. You can find these on the nameplate.

- exact device designation
- device serial number
- year of manufacture

We also require the following data for technical support requests. You can find these in the menu item **Menu → Service → Info.**

- current firmware version
- current hardware version

2 Safety

2.1 Intended use

The GRANUDOS Touch control unit must only be used for the purposes described in the Product Description in *Section 3.2, Product description*! The locally applicable regulations concerning accident prevention, occupational safety and drinking water protection must also be observed!

2.2 Safety notices

Carefully read and comply with the operating instructions prior to install, maintenance and use of the device! Work on the device and changes in the settings may only be carried out by properly instructed persons!

IT safety
The GRANUDOS Touch control unit makes remote display possible using network-enabled devices. The operator is responsible for ensuring that only authorised persons can access the device. The operator, or his authorised representative, is further responsible for the safety of all Internet or WLAN connections.

2.2.1 Handling of chemicals, risks to humans and the environment

In emergencies when handling chemicals, you can also contact the emergency poison centre!

Emergency number:
Munich Emergency Poison Centre (or any other Poison Centre)
Phone: +49 89 19240

Excerpt from the Accident Prevention Regulations, GUV-V D 5

Installation rooms for chlorination systems and storage rooms
Section 3a. (1) Chlorination systems must be installed in lockable rooms and the chemicals intended for the chlorination must be stored in lockable rooms.
Re Section 3a Para. 1:
This requirement ensures that chlorination systems and chemicals shall be protected against weather effects and unauthorised access.
(2) Rooms in accordance with Para. 1 must not be intended for the permanent presence of persons.

Re Section 3a Para. 2:
..... A "permanent presence" is given when persons are present in the room for more than 2 hours per day. Repair and maintenance work on the chlorination system are exempt from this.

2.2.2 Protective measures and rules of conduct

CORROSIVE!
The GRANUDOS Touch control unit controls devices that dose corrosive chemicals. For this reason, it is essential that you observe the safety information relating to the device!

ESD SENSITIVE!
The electronic components in the device controls are sensitive to electrostatic discharge. For this reason, the generally accepted safety precautions for ESD-sensitive devices must be observed when handling the devices, including:

- **Discharge of personal static charge**
- **Dissipative clothing**
- **Disconnect the device from the voltage supply**

3 Product description - scope of delivery

3.1 Scope of delivery / accessories

The GRANUDOS Touch control unit is delivered with the dosing device GRANUDOS as standard.

In addition, customer-specific or order-related modifications are possible; e.g. remote display.

3.2 Product description

The GRANUDOS Touch control unit is intended solely for control tasks associated with the treatment of swimming pool water. It is used for the following 2 dosing devices:

- GRANUDOS 10 Touch
- GRANUDOS 45/100 Touch

The control system has the following main functions:

- dosing chlorine granulate with screw conveyor
- Dosing acid with hose pump directly from the delivery canister
- high-chlorination with switching a control valve – for backwash disinfection or filling of a buffer tank with chlorine solution for disinfecting additional small pools with dosing pumps (option)
- Fault message potential-free
- PC link, remote display via LAN
- Remote display (optional)

3.2.1 Device overview

The GRANUDOS Touch control unit is delivered as a ready-assembled unit.

Figure 1, GRANUDOS 45/100 Touch and GRANUDOS 10 Touch

1. Control unit GRANUDOS Touch
2. Hose dosing pump (covered)
3. Suction sets (covered)

3.3 Identification of device / nameplate

For spare part orders and troubleshooting, it is useful to know the device serial number and the firmware version. The device serial number is located on the nameplate on the right side of the control casing. The firmware version can be found using the menu item **Menu → Service → Info**.

Nameplate see OI Part 1 for the dosing devices

- **for Granudos 10-Touch, No.: BA SW 002**
- **for Granudos 45/100-Touch, No.: BA SW 003**

3.4 Technical data

	GRANUDOS 45/100 Touch Control Unit	GRANUDOS 10 Touch Control Unit
Connection data		
Electric connection data	230VAC/50Hz ± 10%, 35W, I max. 0.2A, standby 22VA, safety (Schuko) plug	230VAC/50Hz ± 10 %, 35W, I max. 0.2A, standby 22VA, safety (Schuko) plug
Protection class	Casing IP54	Casing IP54
Interface connection	Modbus TCP, USB for data export	Modbus TCP, USB for data export
Operating data:		
Measuring range	pH value: 2.00 to 12.00	pH value: 2.00 to 12.00
Medium temperature Ambient temperature Humidity engineering room	0°C to 40°C 5°C to 35°C max. 80% non-condensing	0°C to 40°C 5°C to 35°C max. 80% non-condensing
Concentration hypochlorous acid	max. 0.4%	max. 0.2%
Room ventilation (in and out)	According to DIN 19643	According to DIN 19643
Material	Casing: PS	Casing: PS
Firmware version	—	—
Hardware version	—	—

3.5 Transport / storage

Please check the devices immediately upon receipt for potential transport damage.

ATTENTION!

The systems and devices can be damaged by frost or high temperatures. Avoid exposure to frost during transport and storage! Do not store systems and devices next to objects with strong heat emission or in direct sunlight. The device may only be transported and stored in its original packaging. Please ensure careful handling.

4 Installation

See operating instructions Part 1 Dosing technology, regarding the respective dosing device.

- **for Granudos 10-Touch, No.: BA SW 002**
- **for Granudos 45/100-Touch, No.: BA SW 003**

5 Commissioning

5.1 Commissioning, - comments

The work described here may only be carried out by trained specialist personnel from a specialist company. Prior to commissioning, the installed devices must be checked for proper installation and leaks.

The device has been delivered with specific factory settings. The settings can be found in the operation data sheet in *Section 9.4.*

NOTICE!

Check all of the screw connections on the device. Plastic screw connections may only be fastened hand-tight!

5.2 Commissioning tasks

The mechanical commissioning is now completed. The device is assigned with predefined parameters at the factory. Please adjust the parameters to your pool, taking into account the required dosing performance and target values.

6 Operation / service

NOTICE!
The nationally applicable accident prevention regulations must be observed.

6.1 General

Once all the preparations for commissioning have been completed, the settings can be made on the GRANUDOS Touch dosing system.

6.2 Control unit GRANUDOS Touch

The GRANUDOS Touch control unit is equipped with a touch-sensitive display. Settings can be made by tapping on a symbol. The adjustment menus come with additional text-based instructions.

6.2.1 Operation display – Automatic operation

The control unit of the GRANUDOS Touch is simple and easy to operate using a 7" touch display. The operating modes and faults are displayed directly in the start screen: see *Figure 2, Automatic operation.*
In automatic operation, the current operating status, fill levels, and active inputs and outputs are displayed (**IN – OUT**). The inputs and outputs can be operation messages or fault messages.

Operating notes:
The operating status is displayed in the status line. The following operating states are available:

- Dosing delay
- Automatic
- Manual dosing
- Menu
- Adjustment
- Output test
- Input test

The device is operated using a resistive touch display. Desired parameter changes, calibrations and tests can be done simply by lightly touching the corresponding symbol or the numeric value.

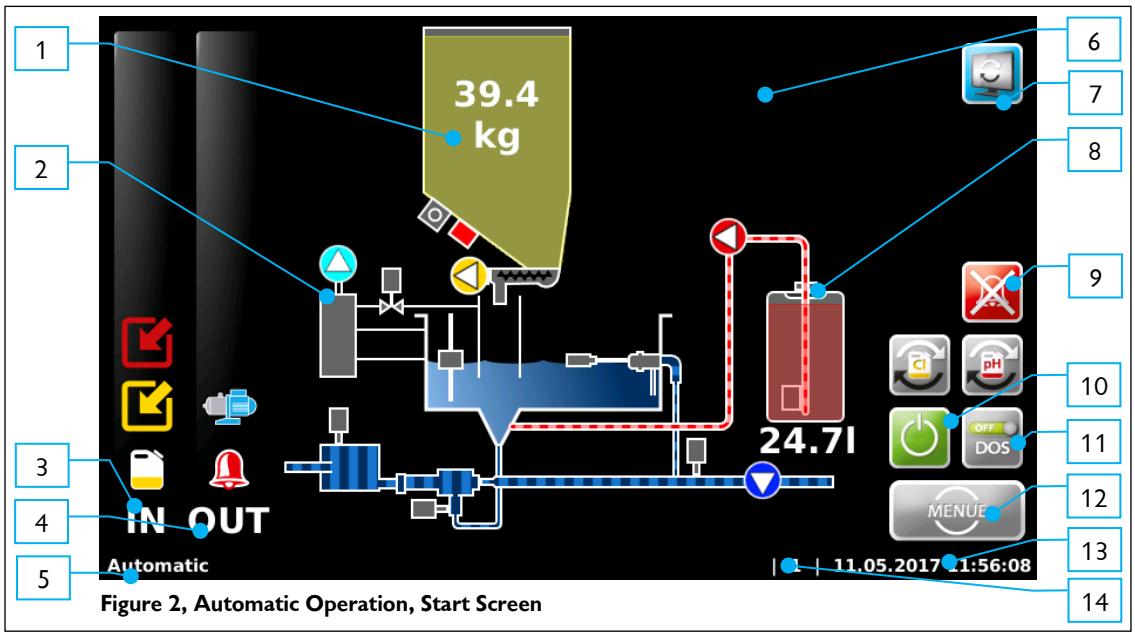


Figure 2, Automatic Operation, Start Screen

1. Fill level chlorine granulate
2. Dust extraction (optional)
3. **IN** list
4. **OUT** list
5. Status line
6. Measuring value pH (optional)
7. Switch over “start screen/buffer tank”
8. Acid fill level
9. Cancel alarm
10. Start / Stop dosing device
11. Activate / deactivate dosing manually
12. Menu button
13. Date / time bar
14. User level (0=guest, 1=end user, 2=technician 1)

The **IN** list shows the input signals to the control unit.
The **OUT** list shows the active output signals of the control unit.

Symbols used:
The symbols depend on the firmware installed i.e. on the device version

The function buttons on the start screen


Switch to buffer tank view

Reset chlorine consumption counter

Reset acid consumption counter


Dosing device on/off

Deactivate dosing manually e.g. for for servicing works


Deactivate alarm relay

View main menu

IN list (general)


red = pH level (container for pH regulation empty)
yellow = disinfection level (container for disinfectant empty)
blue = flocculation level (container for flocculant empty)

High chlorination (e.g. for filter disinfection) active

The controller is deactivated by the central control technique.
No dosing, no alarm message given.


The dosing is blocked by an optional flow switch in the clean water line.
No dosing takes place


A dynamic dosing time has been exceeded. The respective output is blocked.


Dosing deactivated manually


red = Input signal external acid control active
yellow = Input signal external chlorine control active

The pressure at the GRANUDOS booster pump is too low. The booster pump is being stopped

The level in the GRANUDOS flushing tank is too low. The booster pump is being stopped

The level in the GRANUDOS flushing tank is too high. The dosing of chlorine and acid is stopped

The flow in the GRANUDOS is too low. The dosing of chlorine and acid is stopped.

The fuse of the chlorine dosing motor has tripped.

OUT – List

red = acid dosing output active
yellow =-chlorine dosing output active

The alarm relay is active.

Chemical reserve
Advice notice for container exchange, check chemicals status and prepare new chemical

The booster pump is active

The knocker is active. This symbol is only displayed very briefly

The following symbols relate only to the buffer filling OPTION.

IN List (optional, design with buffer tank))

Buffer tank filling is starting

Buffer tank filling is ending

The buffer tank level has dropped too low. Chlorine dosing is stopping

The buffer tank level is too high.
Chlorine dosing, acid dosing and the booster pump have stopped.

Alarm collecting basin (leaking)
Chlorine dosing, acid dosing and the booster pump have stopped.

The optical sensor on the cyclone did not detect any chlorine while the buffer tank was being filled. Filling has been stopped.

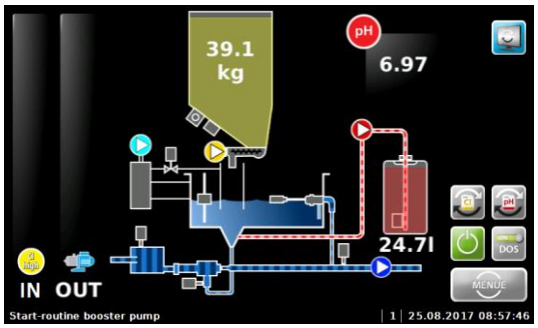
Buffer tank filling has been deactivated by the system. Filling was performed too slowly or the optical sensor on the cyclone was triggered.

OUT List (optional, design with buffer tank)

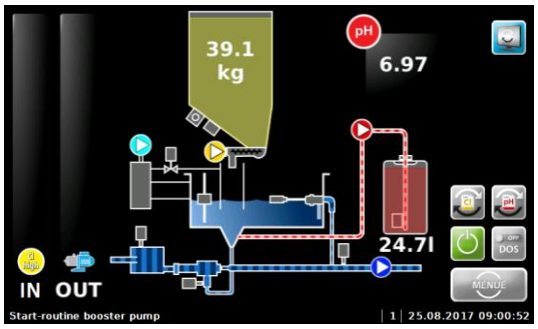
Buffer tank filling is active.

Operation display:
Depending on the operation state, the display shows different views. The following illustrates and describes the main display views.

6.2.2 Start –Delay booster pump and dosing delay

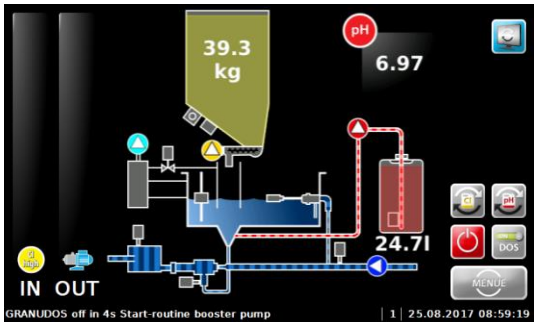


If the device is restarted, the start delay circuit booster pump and dosing delay runs while no dosing output is triggered.
Software alarms are suppressed during this time.
The device then switches to automatic operation



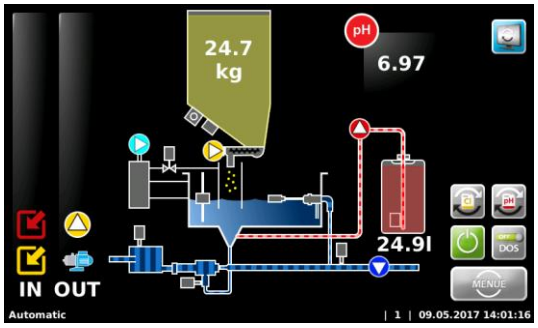
In the event of a booster pump delay, the indicated delay runs out and the booster pump then starts.
(Serves to vent the supply line.)

The icon  (top right) can be used to switch to the "Buffer tank operation" display.



If the dosing device is reset externally, dosing stops and the booster pump runs on for a short time afterwards, so that there is no chlorine remaining in the suction line.

6.2.3 Automatic operation

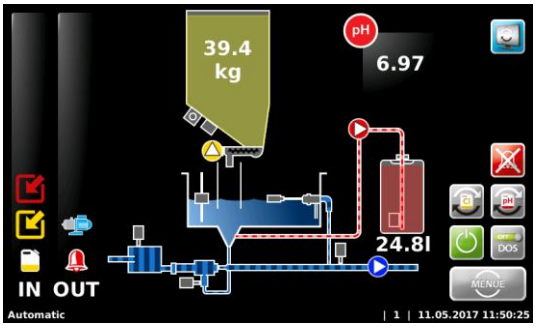


The device is in automatic operating mode. The device doses when requested.

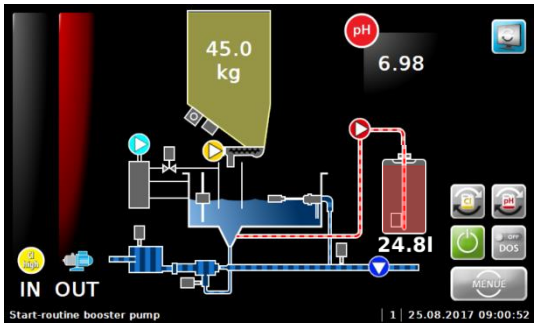
There is no disruption.

The **OUT** list shows the currently active outputs and/or actuators as an example.

6.2.4 Alarm



If an alarm occurs, this will be indicated by the symbol in the **OUT** list.
The alarm relay is activated.
The alarms are distinguished from each other (software alarms e.g. dosing time monitoring and faults (switch inputs)).
In the event of measuring value alarms, the respective measuring value is additionally illustrated in red.
In the event of disruptions, the corresponding symbol appears in the ***IN*** *list.*
Alarms or faults must be pending for approx. 5 seconds before an alarm is triggered.



The button can be used to deactivate the alarm relay temporarily, without rectifying the fault.

The GRANUDOS starts now with the „start routine“

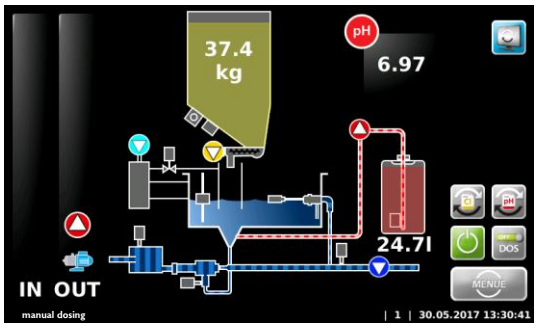
If a fault occurs again, or the fault is not rectified, the alarm relay will be reactivated.

Tipp

Tip!

An alarm will be automatically deleted when its cause has been remedied. When, for example, the empty chemical container has been replaced.
However, the alarm switch-off time monitoring must be acknowledged manually!

6.2.5 Manual dosing (emergency programme)



In the event of a fault with the external measurement technology that cannot be rectified, for a limited period of time, the disinfection dosing and the dosing of the pH value regulation can be performed via the emergency function Manual operation.

If this operating mode is selected (see *Section 6.3.2.1)*, the display in the status line changes from automatic to manual dosing.

6.3 The Main Menu

Automatic
Leads to start screen and into automatic operation; switches automatically to user level 0 or 1. In manual operation mode, a different symbol is displayed here.

Settings
For adapting parameters and system settings

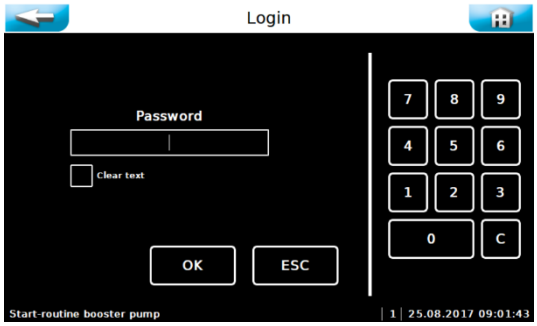
Service
Input and output test, info

Login
For password assignment; no password is assigned in the delivery state.

Log
For query of events and data logging

Calibration
Calibration of pH electrode

6.3.1 Main Menu Login



Passwords are given under Settings → System → Password. The control unit is protected from unauthorised access by a personal password. Settings, calibration, output tests etc. cannot be performed without a password. You can still browse the menu and view the data logging.

If no password has been assigned in user level 1, then it immediately switches to user level 1!

For future changes and adjustments, you must sign in with your personal password under Login. If you switch to the start screen, the password must be re-entered.

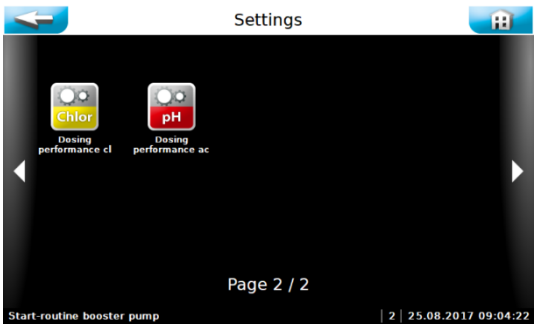
Hinweis

NOTICE!

Once a password has been assigned, unauthorised persons will be denied access to the control unit. The setting buttons will appear in grey. Desired changes can only be made after the password has been entered. Once a password has been assigned, make a note of the password and keep it in a secure location.

6.3.2 Main Menu → Settings (overview)

The settings menu is used to implement the desired settings for the dosing device. Using the white arrow keys on the side, you can navigate to the next screen menu. The 2nd page is only displayed in user level 2 (technician 1).



Dosing performance chlorine/acid *(6.3.2.1)*
Adjust the dosing performance to the basin size

Reserve indication chlorine *(6.3.2.2)*
Set reserve message for disinfectant

Reserve indication acid *(6.3.2.3)*
Set reserve message for pH reducer

Shock chlorination *(6.3.2.4)*
Set dosing performance for the Shock chlorination function

System *(6.3.2.5)*
Set date, time, password, display, network and language

Determining dosing performance chlorine *(6.3.2.6)*
Dosing performance (dosing quantity) is being detected

Dust extraction (optional) *(6.3.2.7)*
Set parameters for dust extraction

Buffer (buffer tank) *(6.3.2.8)*
Set dosing performance for buffer tank filling function

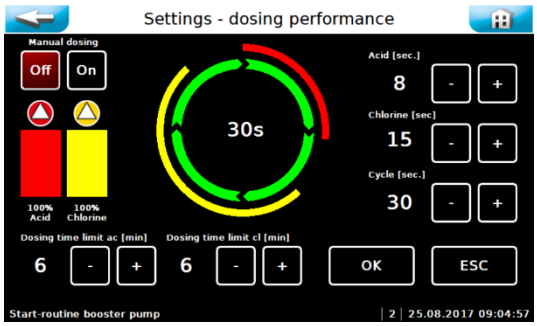
pH Supervision *(6.3.2.9)*
Set parameters for pH monitoring

Delay booster pump *(6.3.2.10)*
Set delay time for the start of the booster pump

Dosing performance cl granulate (customer service technician only) *(6.3.2.11)*
Set device-specific dosing parameters

Dosing performance acid (customer service technician only) *(6.3.2.12)*
Set device-specific dosing parameters

6.3.2.1 Main Menu → Settings → dosing performance chlorine/acid



The dosing performance menu serves for adjusting the dosing performance to the expected consumption of chemicals in the pool.
Especially in case of lower water content, it is very important to adjust the dosing performance.
The required dosing performance depends on several factors, e.g., the basin volume, location, type of use and of course the frequency of use by pool visitors.

Explanation of setting parameters

- Chlorine: → Dosing time of chlorine granulate adjustable from 1-15 seconds
- Acid: → Dosing time of acid in seconds adjustable from 1-8 seconds

ATTENTION!

The use of sulphuric acid is generally possible up to a concentration of 50%. For higher concentrations or when using other acids (e.g. hydrochloric acid, dissolved sodium bisulphate, etc.), the changed dosing performance and/or increased corrosiveness must be observed! We recommend to consult with the company WDT!

- Cycle: → Length of complete dosing cycle adjustable from 30-360 seconds
- Dosing time limit acid: → Dosing time monitoring for external control adjustable from 0-100 minutes
- Dosing time limit chlorine → dosing time monitoring for external control adjustable from 0-100 minutes
- Manual dosing off / on: → Switch between automatic and manual dosing

Explanations of the dosing process

Chlorine and acid are dosed at intervals with pauses between the dosings.
The dosing is organised in dosing cycles (time from dosing interval to dosing interval) and dosing times (dosing times for chlorine and acid dosing motors).

A dosing cycle proceeds like this:

1. Chlorine dossing - 1-15 sec.
2. Pause - 3.5 sec.
3. Acid dosing - 1-8 sec.
4. Pause until end of cycle

This cycle runs continuously with "manual dosing".
In "Automatic" mode, the cycle will also run, but the dosing will only be activated if the control command for dosing (chlorine or acid) is pending. If the control command hits for a pause, the corresponding dosing will be activated in the next dosing cycle.

Example for setting the dosing performance

Prerequisite: Indoor pool with a circulation capacity of 200m³/h. In accordance with DIN 19643, in indoor pools 2g of chlorine must be added per each 1m³/h circulation capacity.
Calculation: 200m³/h x 2g chlorine = 400g/h chlorine dosing
Maximum dosing performance **GRANUDOS 45** = 2000g/h = 100%
That means that the dosing performance must be set to 20% for a chlorine dosing of 400g/h.
The acid dosing is initially set to the same value, i.e., at 20%.
A readjustment may be necessary during ongoing operation.

Explanation of dosing time monitoring

If the GRANUDOS is controlled by a measuring and control device, the dosing performance must be set sufficiently high so that even large loads can be regulated without large deviations from the target value. This means that the pause times must always be greater than the dosing times. If, however, the dosing times are longer than the pause times, there is a fault with the measuring and control device (e.g. control relay hanging) or the dosing performance is too low (set too weak or motor or dosing screw faulty) or the input relay on the GRANUDOS control plate hangs. The dosing time monitoring totals the dosing times against the pause times and if the set dosing time limit is exceeded, dosing is deactivated and indicated as a fault.

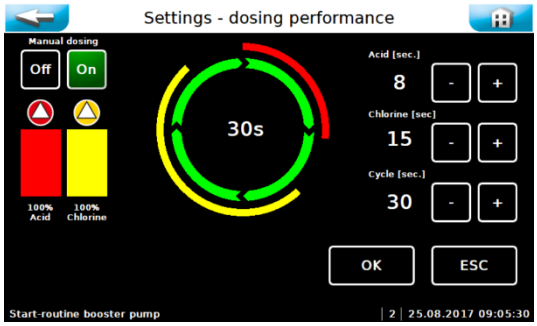
Both the chlorine-control and pH-control or -dosing is monitored.

Explanation regarding the operation with external acid control (pH)

If a (existing) external dosing pump is to be operated for regulating the pH-Value, it must be remembered that the acid dosing in the GRANUDOS is always active in order to avoid deposits in the solvent system.
In this case the acid control input can be clamped parallel on the chlorine control input (wire bridge).
With 230V control: on pin connector Nr. SL7 on the power plate NT-GRD, clamp 1+3 and clamp 2+4 is to brigde.
With potential-free control: on the I/O plate on pin connector Nr. SL10, clamp 1+3 and clamp 2+4 is to bridge.
Thus, during each chlorine dosing the acid dosing is activated as well. The dosing performance for the acid dosing must be set to a low value here for the required cleaning function. However, it must also be checked whether the set dosing performance is sufficient for the cleaning: the cyclone may not get turbid. *See also Section 6.3.2.12, Page 22.*

Tip!

It is urgently recommended to connect the pH-control at the GRANUDOS to avoid acid overdosing in the event of a fault in the chlorine dosing.



Manual dosing Off/On

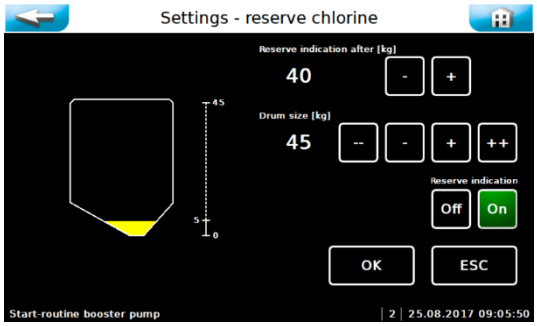
It is possible to change over to continuous manual dosing. This may be required in the event of a fault with the measurement technology, e.g. electrode failure, that cannot be rectified. For a limited period of time, both the disinfection dosing and the dosing of the pH regulation may be performed via the emergency function Manual operation.

After activation of Manual dosing, the display in the start screen changes.

CAUTION!

In the operation mode Manual dosing, the operating personnel must continually check the water quality and adjust the dosing amounts. Non-compliance with this may result in significant incorrect dosing!

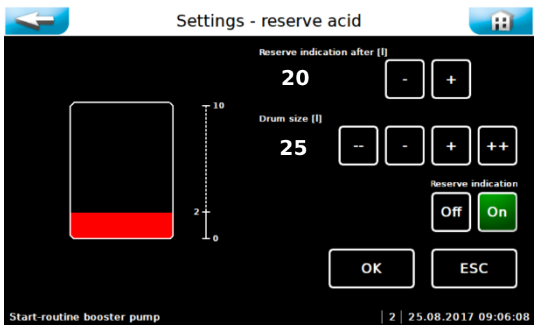
6.3.2.2 Main Menu → Settings → Reserve indication chlorine



The quantities for which a reserve message will be displayed after dosing are indicated here, as well as the size of the full container.
The message indicates that the chemical container will soon be empty.

The reserve message function can also be deactivated.

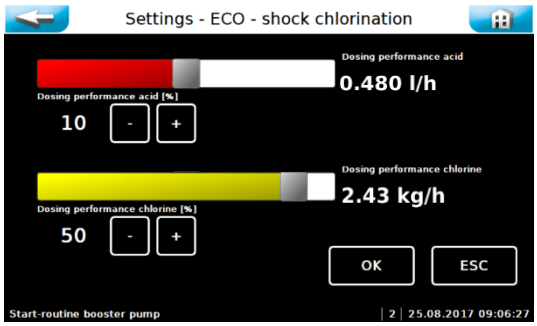
6.3.2.3 Main Menu → Settings → Reserve indication acid



The quantities for which a reserve message will be displayed after dosing are indicated here, as well as the size of the full container.
The message indicates that the chemical container will soon be empty.

The reserve message function can also be deactivated.

6.3.2.4 Main menu → Settings → ~~ECO –~~ ~~shock~~ high chlorination



This menu lets you adjust the dosing performance during a high chlorination – e.g. for buffer tank filling of filter disinfection. For monitoring purposes, the concentration **must be analysed photometrically** during shock chlorination!

6.3.2.5 Main menu → Settings → System

Date/ Time
Set date and time

Password
Assign a password

Display brightness
Adjust the display brightness to the ambient conditions

Network
Set network parameters

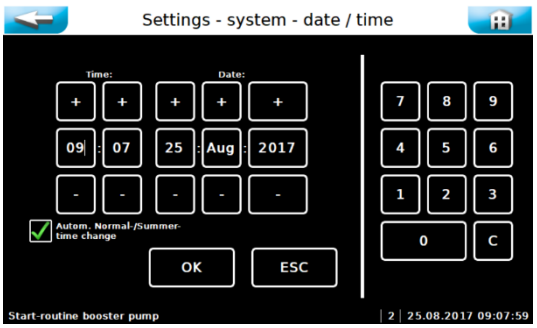
Reset
Select the user language

Language
Select the user language

System ID
For factory customer service only

Internal
For factory customer service only

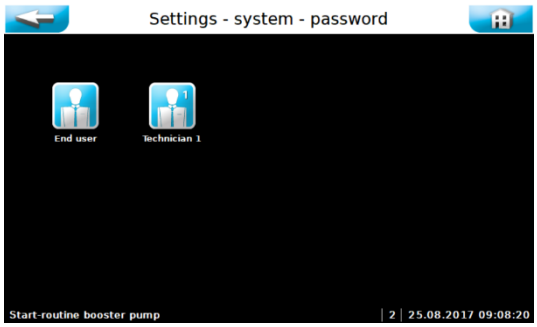
a) Main menu → Settings → System → Date/ Time



Adjust date and time.

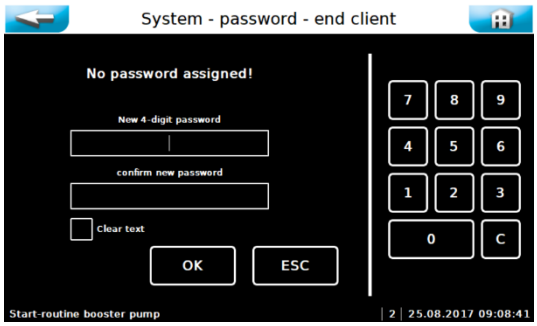
You can activate automatic switching from winter to summer time.

b) Main menu → Settings → System → Password



Guest (user level 0)
No password, read-only rights

End user (user level 1)
There is no factory setting for an end user password. We recommend the assignation of an end user password to protect the system against unauthorised access. Enter the password in the operation data sheet. The individual end user password must contain four digits between 0000 and 9999. In the second line, the password must be entered once again.



Technician 1 (user level 2)
The Technician 1 password consists of five digits and has a factory default setting of 01234. This password is intended for service partners. We recommend that you change this password as well and enter it in the operation data sheet.

If you place a green check mark next to Clear text, the entered numbers are shown instead of white dots.

To change an active end user password, it must be entered in the upper line. The new password must be entered in the two following lines.

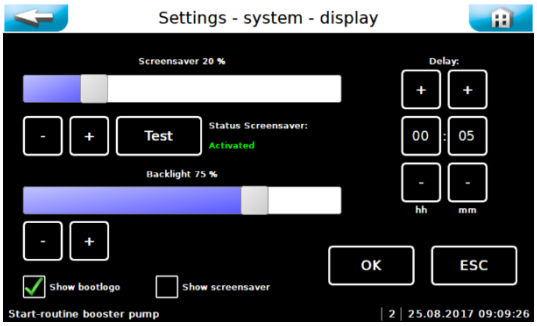
If you wish to delete the end user password completely, simply enter the active password in the upper line. The other two lines remain clear.

If an incorrect password is entered, an error message appears.

Hinweis

NOTICE!
Please store the individually chosen passwords safely in the operation data sheet. Lost passwords can only be reset by the factory customer service!

c) Main menu → Settings → System → Display



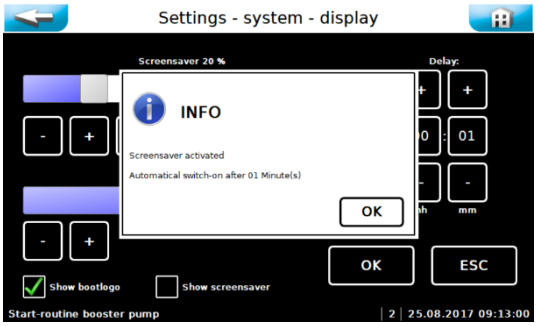
The screensaver dims the background lighting after the set delay time to the selected brightness.
The Test button can be used to test the settings.

The Backlight setting permanently reduces the background lighting in the operating mode.

The boot logo may be displayed when the control unit is activated.

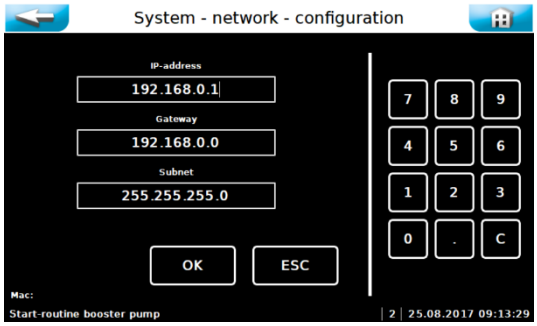
The screensaver may be activated or deactivated.

Save settings using OK and confirm instruction using OK.



NOTICE!
Please reduce the background lighting to the minimal brightness required by you. This increases the service life of the display significantly.

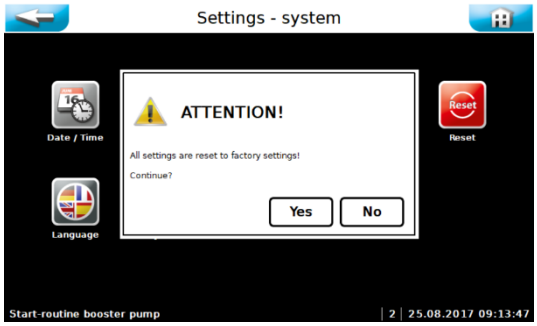
d) Main menu → Settings → System → Network



The touch panel has a LAN interface with RJ45 socket. The current status messages can be transferred to an external display via this interface. The terminal device can be a PC monitor, a tablet PC or a smartphone, e.g.

Further information about this topic is available upon request. The operator must establish the necessary IT requirements for remote access! (e.g., VNP connection, data security, etc.)

e) Main menu → Settings → System → Reset



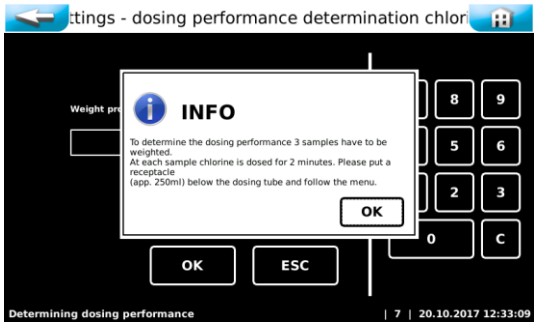
This order can only be performed in user level 2.
All of the set parameters are reset here to the factory settings.
The factory settings are listed in the operation data sheet *in Section 9.4*.

After "reset" all individual setting must be set again!

f) Main menu → Settings → System → Lanuage

Select the desired operating language.

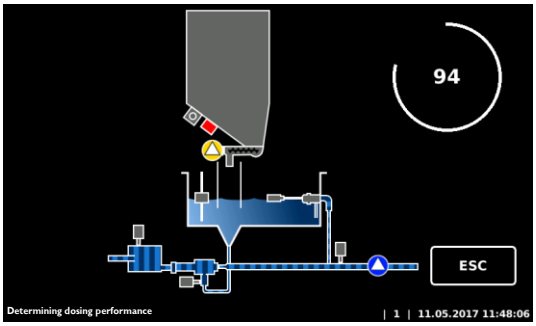
6.3.2.6 Main menu → Settings → Determining dosing performance



The effective dosing performance must be determined in order to calculate chemical consumption and thereby the reserve message.

Follow the menu prompts. A dosing sample is taken 3 times.

NOTICE!
Place a shallow collecting vessel under the dosing pipe and follow the menu prompts. Weigh the dosing sample.

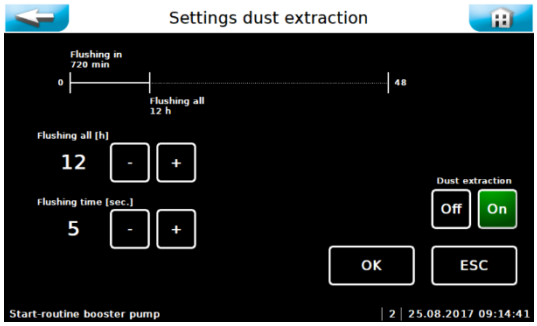


Tipp

Tip!

If the granulate manufacturer changes, or the grain size of the granulate changes significantly, dosing performance determination must be performed again so that the reserve message is accurate.

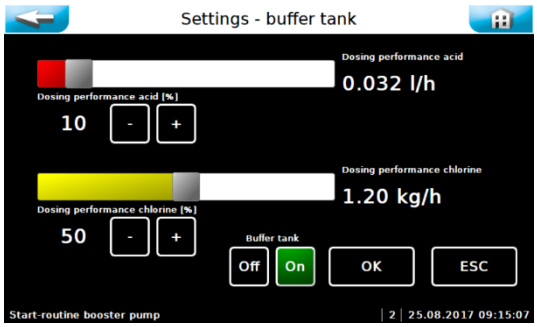
6.3.2.7 Main menu → Settings → Dust extraction (optional)



The dust extraction parameters are set here.

Set flushing interval
Set flushing time
Switch dust extraction on or off
Confirm settings using OK.

6.3.2.8 Main menu → Settings → Buffer tank



This menu makes it possible to set the dosing performances for filling the buffer tank. Select the dosing performance so that the required concentration is present after the buffer tank is filled. For monitoring purposes, the concentration and pH value must be analysed repeatedly after the buffer tank has been filled!
The pH value in the buffer tank must be between 6.8 and 7.2.

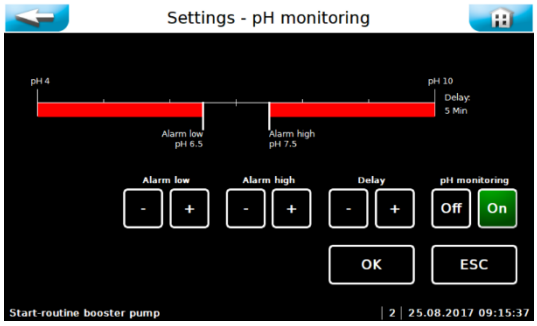
Off - On: → Activate or deactivate buffer tank filling function permanently. The filling is regulated automatically via the level control in the buffer tank.

Hinweis

NOTICE!

When first commissioned, or if the buffer tank is empty, the "Start switch monitoring" error must be confirmed twice, until the "Start filling" level is reached.

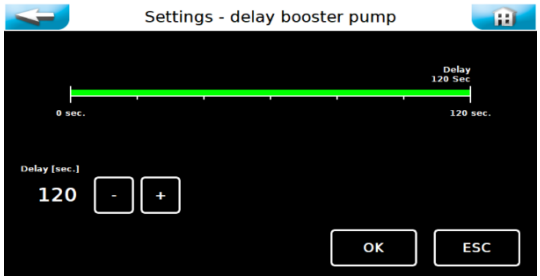
6.3.2.9 Main Menu → Settings → pH Supervision Buffertank



The parameters for pH monitoring and alarm message are set here.

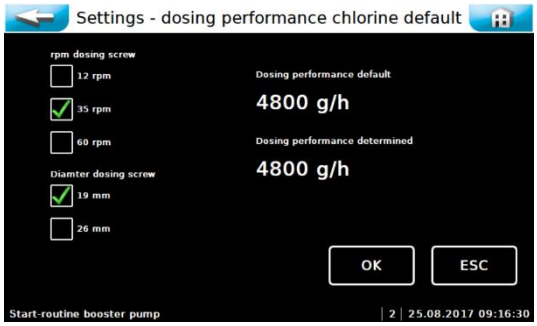
Alarm low: → Lower alarm value
Alarm high: → Upper alarm value
Delay: → for fine adjustment of the monitoring
pH supervision off / on: → Operating mode pH supervision on / off

6.3.2.10 Main menu → Settings → Delay Booster pump



This function is active when the GRANUDOS is being controlled externally. This allows the booster pump to be started with a set delay time e.g. after the swimming pool filter has been rinsed. This ensures that there is no more air in the pipe that could cause troubles at the GRANUDOS after restart.

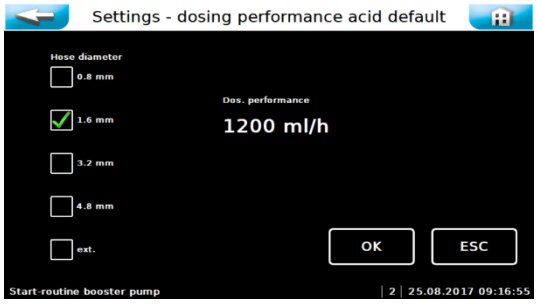
6.3.2.11 Main Menu → Settings → Dosing performance chlorine default – fit in dosing components



These settings can only be implemented in user level 2. The values set here depend on the type of dosing device. The values are preset in the factory and are used as the basis for determining the dosing quantities and reserve display.

Attention:
These values must only be changed if the appropriate components have been installed in the dosing device. Otherwise, the dosing quantities will be determined incorrectly!

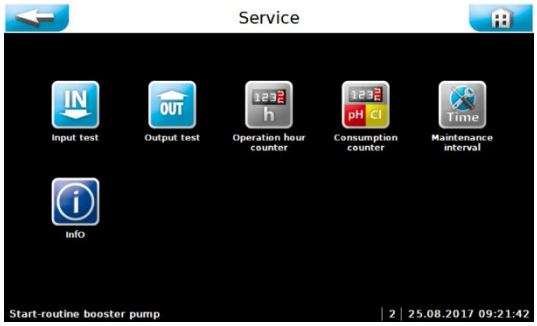
6.3.2.12 Main Menu → Settings → Dosing performance acid default – fit in dosing components



These settings can only be implemented in user level 2. The values set here depend on the type of dosing device. The values are preset in the factory and are used as the basis for determining the dosing quantities. If an **external acid pump is used**, "external" must be ticked here and the dosing performance of the external pump entered.

Attention:
It is important that the correct dosing performance is entered since otherwise the dosing device will not function correctly!

6.3.3 Main Menu → Service



Input test
A test programme for switch inputs (electrical signals).

Output test
A test programme for pumps and relay outputs.

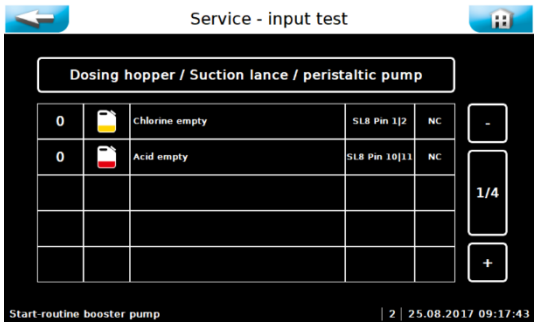
Operation hour counter
Counts the operating hours for booster pump, acid dosing motor, chlorine dosing motor and dust extraction flushing.

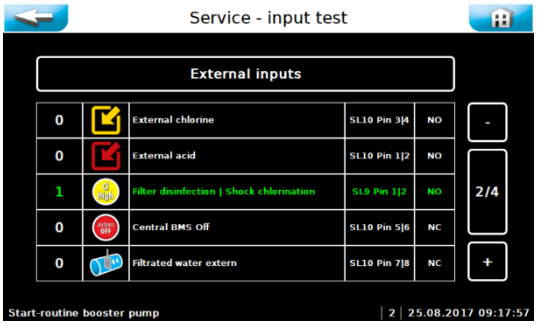
Consumption counter
Counts chemical consumption.

Maintenance interval
Sets time interval for maintenance message

Info
For querying the firmware versions.

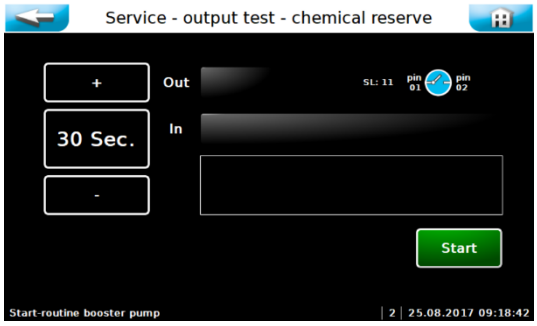
6.3.3.1 Main Menu→ Service → Input Test





The input test serves for checking the connected inputs (switches). The changing activation of the switch inputs is indicated by 0 (open) or 1 (closed).
The fourth column displays the pin header (SLx) and the connectors (Pinx/x) to which the switch is connected.
The fifth column shows the function of the switches NO or NC, respectively.
NO (normally open) indicates open in the operating state and closed in the event of a fault.
NC (normally closed) indicates closed in the operating state and opened in the event of a fault.
You can scroll through the 4 pages using the + and – buttons.

6.3.3.2 Main Menu → Service → Output test

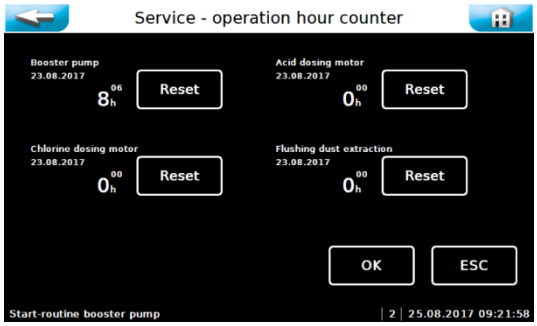


The output test is used for checking the connected outputs (pumps, motors and relays). The selected output is activated for 30 seconds. The control can be deactivated at any time using “Stop”.

For safety reasons (generation of chlorine gas), the output test for the chemical-dosing outputs is only released if no fault exists that could prevent the dosing.

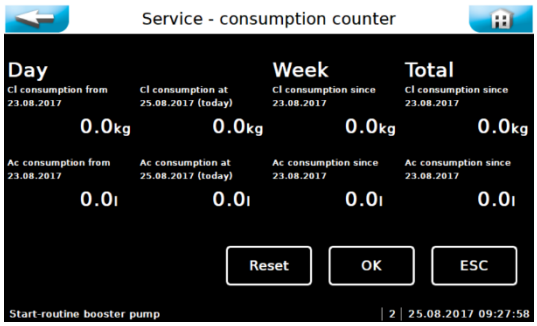
An output test can be performed for the following actuators:
- pH dosing
- Chlorine dosing
- Knocker
- Solenoid valve buffer tank
- Alarm
- Chemical reserve
- Chemical empty
- Dust extraction flushing

6.3.3.3 Main Menu → Service → Operation hour counter



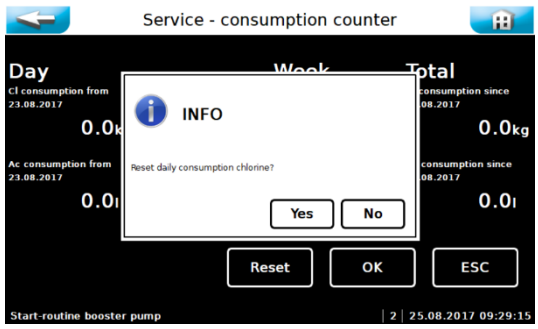
Reset operating hours for each individual actuator.

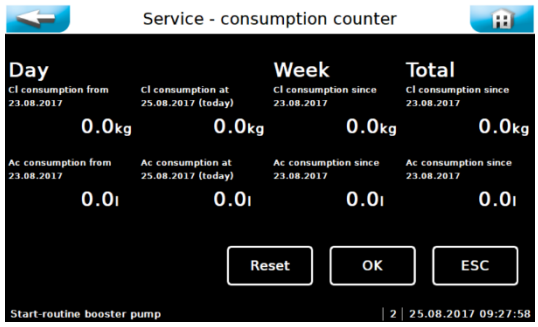
6.3.3.4 Main Menu → Service → Consumption counter



The consumption counter summarises consumption of each chemical. The reset button can be used to reset each individual consumption reading to 0. In order to reset, you must be logged into user level 2.

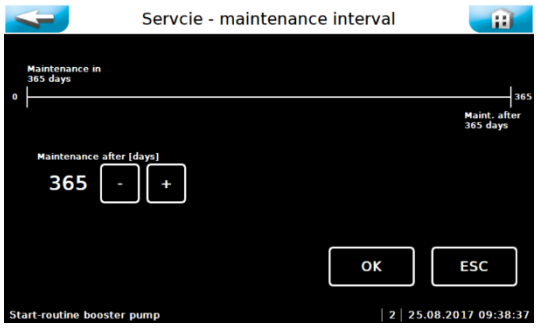
Each value is called up and must be confirmed individually.





The previous operating day's consumption (left column) cannot be reset.

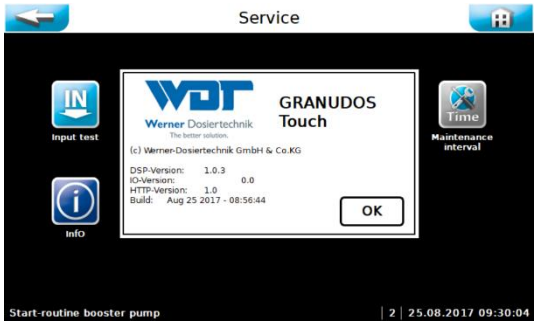
6.3.3.5 Main Menu → Service → Maintenance interval



The time interval for the maintenance message in days is set here. After the set time interval the 

symbol is used on the start screen as a reminder of any pending maintenance works.

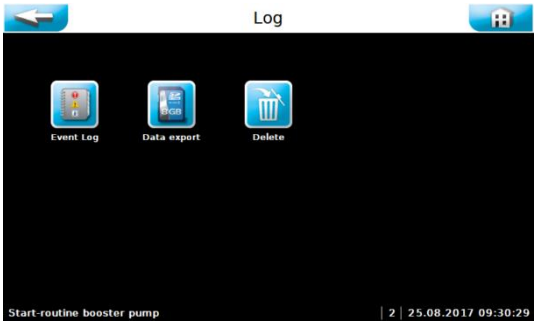
6.3.3.6 Main Menu → Service → Info



The software and device data used can be viewed using the Info button.

The following are distinguished:
DSP version: → Firmware version
I/O version: → Coprocessor version on the I/O board
HTTP version: → Web front-end version (user interface software version).
Build: → Date of manufacturing

6.3.4 Main Menu → Log (event and data logging)

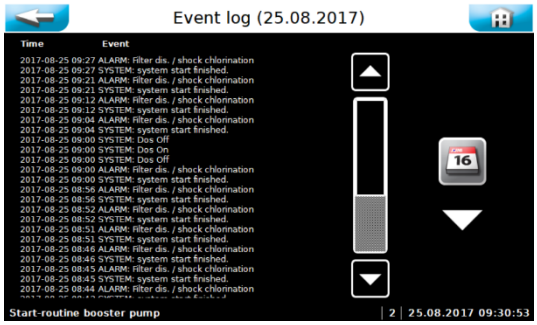


Event Log
Displays a chronological list of the events that have occurred

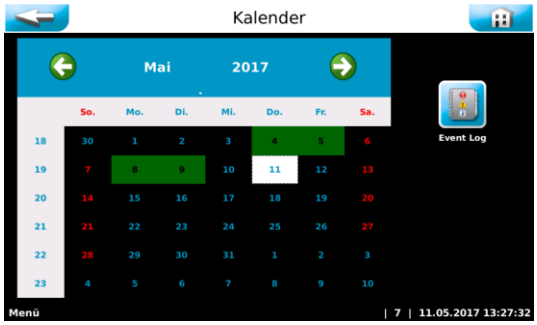
Data export
Used for exporting the collected data to a USB stick

Delete
Used for deleting the stored data

a) Main menu → Log → Event Log

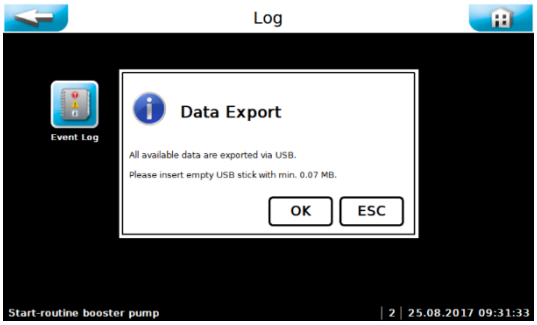


When calling up the menu, a list of events that occurred on this day will be displayed.
You can use the Calendar ICON to view events from previous days.



The current day is highlighted in white. Days on which the control was activated are shown on a green background. If you select another day by touching it, that day will be shown on a white background. You can use the Event Log ICON to view the events of the selected day.

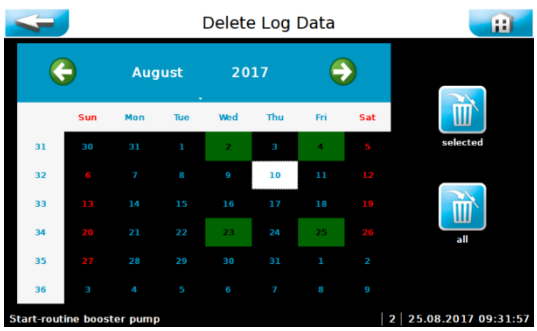
b) Main menu → Log → Data export



You can use the Export menu item to load the stored log data onto an *empty* USB stick. If the USB stick is not empty, formatting is suggested and will be carried out after you confirm with OK.

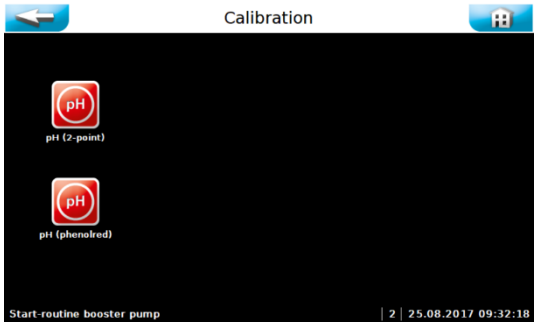
The daily event files and CSV files can then be found on the USB stick.

c) Main menu → Log → Delete



The current day is highlighted in white. Days on which the log files were stored are shown on a green background. If you select the desired day by touching it, that day will be shown on a white background. You can use the selected ICON to delete the event log events and the data log events for the selected day.
With the ICON, all event log events and data log events can be deleted at once.

6.3.5 Main menu → Calibration (Optional for design with buffer tank)

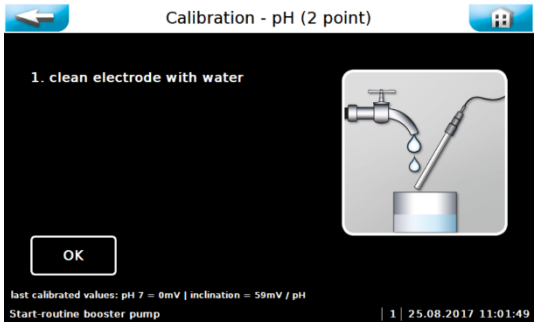


ph (2-point)
Two-point calibration of the pH electrode

pH (phenolred)
One-point calibration of pH electrode

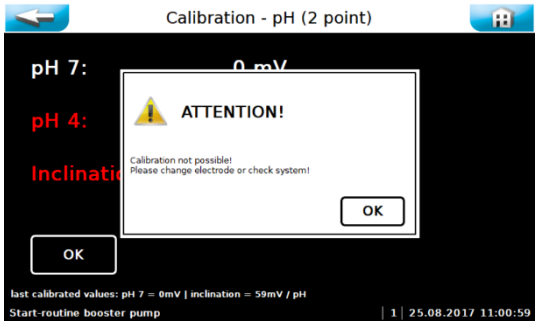
The calibrations are graphically guided and are accompanied by a help text. Follow the menu prompts. Use the OK button to acknowledge the completed steps.

6.3.5.1 Main Menu → Calibration → pH (2-point)



Perform calibration in accordance with the instructions.

Once the pH calibration has been completed, the measuring results for the offset voltage and conductance voltage are displayed and an evaluation of the electrodes carried out. In case of minor deviations, the calibration is adopted immediately. In case of "medium" deviations, a cleaning notice is displayed. In case of major deviations, the exchange of the pH electrode is suggested. If the exchange of the electrode does not remedy the problem, the fault may be with the electrode cable or the measuring amplifier.



pH7 = buffer solution for determining offset voltage.
The optimal offset voltage is at 0mV up to +/-30mV.

pH4 = second buffer solution for determining conductance voltage.

Slope (Inclination) mV/pH
The optimal slope voltage at 25°C is approx. 59mV/pH.
(pH7 – pH4 = 3pH x 59mV = 177mV)

Example: (mV(pH 4)= 187mV – mV(pH7)= 10mV) = 177mV ./. 3 pH = 59 mV/pH

Hinweis

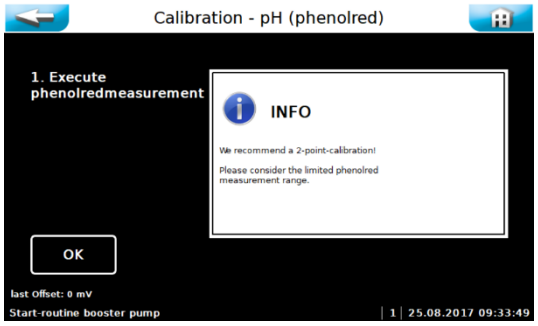
NOTICE!
Notice regarding evaluation of the electrodes

Cleaning notice
If the offset voltage is less than +/-41mV the voltage rating will appear yellow and the calibration will be terminated with a cleaning notice.
If the conductance voltage is between 52mV/pH and 63mV/pH, the voltage rating will appear yellow and the calibration will be terminated with a cleaning notice.

Error notice
If the offset voltage is greater than +/-61mV the voltage rating will appear red and the calibration will be rejected with an error notice!
If the conductance voltage is less than 50mV/pH or greater than 65mV/pH, the voltage rating will appear red and the calibration will be rejected with an error notice!
If the calibration is rejected with an error notice, the device continues the regulation using the values from the most recent successful calibration.
It is necessary to investigate the cause of the failed calibration!

6.3.5.2 Main Menu → Calibration → pH (phenolred)

Notice regarding the phenol red calibration
A two point calibration of the pH electrode overrules the last calibration pH with phenolred.
It should be noted that the measurement of the pH-Value with phenol red may have an error of +/- 0.1 - 0.2 pH.
In addition, the buffer solution is subject to an aging process and can thus additionally provide incorrect values!



Carry out the calibration according to the instructions.

Please observe the displayed notices and follow the menu navigation.

The set deviation is displayed as offset at the end of the menu. In case of minor deviations, the calibration is adopted immediately.
For deviations greater than +/- 41mV a cleaning notice is given.
For deviations greater than +/- 61mV a change of the pH electrode will be suggested. If the calibration is rejected with an error notice, the device continues the regulation using the values from the most recent successful calibration.
If the exchange of the electrode does not remedy the problem, the fault may be with the electrode cable or the measuring amplifier.

7 Maintenance, care, faults

7.1 Device maintenance

We recommend that you assign a specialist firm to carry out regular maintenance. All required maintenance and repair tasks may only be carried out by properly qualified personnel from a specialist company. Required spare parts are available from your specialist supplier.
Please observe the safety notices when handling chemicals and wear appropriate protective clothing.

Tip!
In order to carry out any maintenance work, use the maintenance protocol found in Section *9.5.* - Record this work in the maintenance protocol.

7.1.1 pH Measurement – pH electrode calibration (optional at use with buffer tank)

See also para 6.3.2.9.
Each pH electrode is a wear part. It is subject to a certain degree of ageing, which is due to a variety of factors. In the area of swimming pool water treatment, a life span of 6 months to 2 years may be expected.
The contamination of the electrode may be one reason for measuring value deviations. This contamination can usually be cleaned using the electrode cleaner supplied with the delivery. For this purpose, the glass shaft of the pH electrode is submerged in the electrode cleaner for a few minutes.
Depending on the state and age of the electrode, the electrode's characteristics may change. This leads to measuring value deviations, which can be offset through calibration.

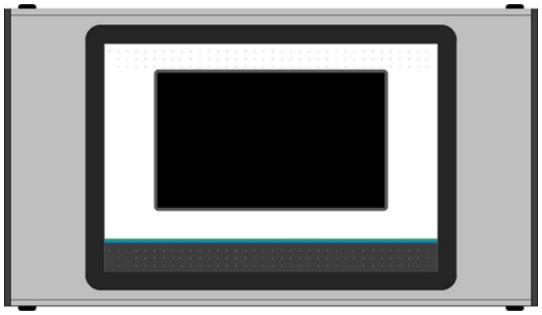
ATTENTION!
During all work on the pH electrode it must be ensured that neither the electrode's screw plug head nor the plug of the electrode cable are exposed to moisture! Even the smallest amount of moisture in the electrode head may lead to a distortion of the measuring value or even to a premature failure of the electrode!
All contacts in the electrode's plug head and on the electrode plug must display a shiny golden colour and may not show any signs of corrosion

NOTICE!
After each cleaning or exchange of the electrode, a calibration must be carried out!
Do not touch the glass top (sensor part) and the diaphragm with your fingers. Dab the glass top with a clean and soft cloth.

7.1.2 Open and close the casing

DANGER!
Risk of death due to high voltage. All electrical work on the device must only be carried out by trained electricians in accordance with the applicable safety regulations!
Fuses inside the control unit casing must only replaced by maintenance or repair personnel.

For Type GR 10 Touch



Depending on the type of device, the display lid can be swivelled to the left or right for installation and maintenance work. The locking axle must be removed for swivelling. The locking axle is identified by the plastic slotted screws on both sides. The other side is equipped with two expanding rivets as pivot bearings.

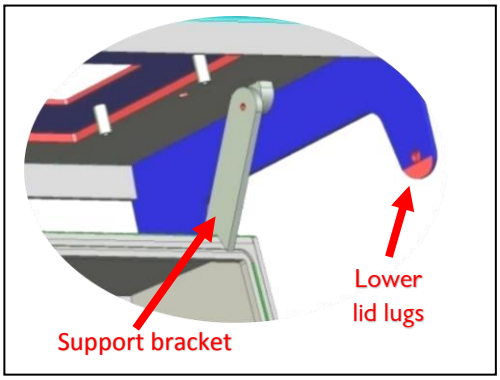
Figure3, Control Unit Casing, Type GR 10 Touch

Tipp

Tip!

It is not necessary to completely remove the display lid for maintenance tasks! Only the locking axle must be removed. Afterwards, the display can be swivelled to the side.

For Type GR 45/100 Touch



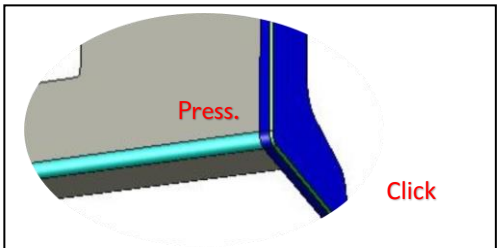


Figure 4, Control Casing Type GR 45/100

The casing has an *Easy Lock-in Closure*. In order to open the display lid or the small connection space cover, the side lid lugs must be gently lifted outwards from the main casing. The display lid can then be pulled forward. The upper lid lugs run in guide grooves up to the front lock-in position.
Afterwards, the display lid is raised. The display lid can be supported on the main casing using a support bracket so that it remains raised for work on the terminals.

In order to close the casing, the support bracket must be unlocked with a backward motion and the lid closed by moving it downwards. The upper lid lugs must now be unlocked and the lid pushed backwards onto the main casing. In order to ensure that it has been completely resealed, press gently on the four corners of the casing.

The casing lid will close with a soft, audible click.
Please make sure that all of the lid lugs have been securely bolted using the safety bolts each time.

7.2 Trouble-shooting

Tipp

Tip!

All disruptions and messages are displayed on the touch screen in the IN list. In addition, they may be-checked in the "Event Log".
An error will only be displayed once it has occurred uninterrupted for at least 6 seconds.
Attention! It is also possible that switches or sensors are faulty and thus do not transmit any electric signals.

Fault display	Cause / effect	Measures
1. Disinfectant (chlorine container) empty ALARM: Chlorine container empty	This notification serves for information purposes only, no action ensues. The disinfection dosing and booster pump run on.	1. Refill chlorine, or change container 2. If the container/hopper is not empty, recalibrate the empty switch or 3. Renew the empty switch.
2. Acid empty ALARM: Acid container empty	The acid dosing stops and the booster pump runs on. **<u>Caution:</u> Chlorine dosing without acid may lead to blockage in the dissolving device.**	1. Replace the empty acid container with a full one 2. If the acid container is not empty, the empty switch is faulty. 3. If the suction lance is new, check the functional direction of the float
3. Chemical container level reserve MESSAGE	This message is only for information, there is no action.	Provide for appropriate supplies.
4. Pressure minimum ALARM: The flow pressure at the booster pump is too low	Dosing is being stopped. The booster pump has been deactivated.	1. Supply pressure too low 2. Booster pump faulty 3. Pressure switch faulty 4. Set a lower response pressure at the pressure switch
5. Flushing tank level minimum ALARM: The water level in the flushing tank is low; more water is suctioned off than runs into the flushing tank through the float valve.	Dosing is being stopped. The booster pump has been deactivated.	1. Float valve function: The water inflow should gently follow the float's movement. When OK, calibrate the water level. See OI Dosing unit, section Commissioning If this is not the case, insert a new membrane in the float valve. 2. Insert a pinhole aperture with a small drill hole 3. Prefilter (Pos. 9) contaminated → clean
6. Flushing tank level maximum ALARM: The water level in the flushing tank is too high, less water is being siphoned off than is flowing into the flushing tank through the float valve.	Dosing is being stopped. The booster pump runs on.	1. If the injector's suction flow is OK: a) Float valve function: The water inflow should gently follow the float's movement. When OK, calibrate the water level. See OI Dosing unit, section Commissioning b) If this is not the case, insert a new membrane in the float valve. 2. If the suction flow is not sufficient, see under fault display "**Suction line flow minimum ALARM**"
7. Suction line flow minimum ALARM: The water flow in the venturi suction line is too low. The switching body of the flow switch does not rise, the switch LED lights up.	Dosing is being stopped. The booster pump runs on.	1. Check booster pump functioning. 2. Prefilter dirty → clean (GR only) 3. Blocked suction opening in the flushing tank 4. There may be particles in the nozzle or in the suction line, due to particles entering during Installation or from the chlorine 5. Insert a pinhole aperture with a larger drill hole or remove it entirely 6. Blocked check valve at the buffer tank 7. Diffuser worn out, if D > 6.5mm, replace diffuser
8. Chlorine dosing monitor in cyclone ALARM: The optical sensor on the dissolving cyclone is activated.	The sensor on the cylcone indicates that after the 2nd dosing interval there is insufficient chlorine in the cyclone.	1. Fault during dosing: Clotting in chlorine granulate Dosing screw blocked due to poor chlorine quality (too fine, moist) 2. The dosing motor is defective. 3. Calibrate the optical sensor.
9. Chlorine dosing motor fuse ALARM: **Supply 24V of sensors- fuse F1 please check indications in the Log-data**	The chlorine dosing stops and the booster pump runs on. At blown fuse F1: dosing and booster pump stops.	Check chlorine motor for blockages, remove blockage if necessary and replace fuse. Check acid dosing motor – replace the fuse. Check sensors "chlorine empty, chlorine missing, suction flow switch venturi"

10. Buffer tank filling start MESSAGE:	Filling starts.	The dosing device starts to produce chlorine solution.
11. Buffer tank filling stop MESSAGE:	Filling with chlorine solution stops.	The flushing cycle starts, then the dosing device stops producing chlorine solution.
12. Buffer tank minimum level ALARM:	The lower control switch for starting the filling has not triggered.	Check switch function: If the tank is empty, the switch contact must be closed (measure at the terminal). If open: Switch or terminal contact faulty
13. Buffer tank level maximum ALARM: **or** **14. Alarm collecting tank**	When filling, the upper control switch maximum level was not triggered to stop the filling. The level switch in the collecting tank reports liquid in collecting basin.	1. Check "Stop buffer tank filling level" switch: If the tank is full, the switch contact of the "Stop buffer tank filling level" switch must be closed (measure at the terminal). If it is open when the buffer tank is full, the switch or terminal contact is faulty. 2. "Stop buffer tank filling level" switch working: →Check switching valves for functioning 1. Buffer tank is overflowing or leaking a) "Stop buffer tank filling level" level switch **and** Level maximum alarm on buffer tank faulty. → Replace level switch b) Leaking check valve at a dosing line → replace check valve c) Leaking buffer tank → replace buffer tank 2. Control valve to the buffer tank not closing
15. Buffer tank filling timeout ALARM:	Filling occurred too slowly. Buffer tank filling has been deactivated by the system.	1. Check switching valves 2. Check "Start buffer tank" sensor: Its contact must be reopened 3 minutes after filling has started!
16. Filtrated water external ALARM: From flow monitoring of the pool circulation	External flow sensor reports flow too low. The dosing and booster pump are stopped.	Check swimming pool circulation; if this is OK, then check the flow sensor.
17. External Off MESSAGE:	The GRANUDOS is switched off by the central control system.	No measures, since it has been deactivated externally.
18. Dosing timeout ALARM:	A dynamic dosing time has been exceeded. The respective output is blocked.	Check dosing screw and dosing pumps for defects and blockages. Eliminate fault or blockage. (see also Section 7 for the relevant dosing unit). Check to see if dosing performance setting is too low.
19. Shock Cl. active MESSAGE:	Shock chlorination / filter disinfection is active.	No measures

Malfunction without display in the device:

1. **The display is dark and the device is turned off:**

a) No supply voltage: → Restore the supply voltage
b) The main fuse at the lower left of the casing has blown: → Replace fuse
c) The fuse F1 at the power supply unit has blown: → Replace fuse, look for reason
d) The power supply unit is defective: → Replace power supply unit

2. **The flushing tank overflows when shutting down the GRANUDOS:**
   In this case, check the following parts:

a) Float valve leaking: → Replace membrane
b) Switching body in suction line blocked: → Foreign matter in suction line → Clean suction line

For how to proceed, see Operating Instructions Part 1 (Dosing Unit) for the respective dosing device, *in Section 7.1, Device Maintenance*.

8 Decommissioning – Storage – Disposal

8.1 General

In the event of decommissioning or risk of frost, the devices must be emptied completely and protected against frost!

8.2 Decommissioning

If the device is decommissioned for an extended period of time (more than approx. 14 days), the following tasks must be conducted.
Depending on the device version, different measures are required for decommissioning. The following works relate exclusively to the pH-measurement techniques.
For required work on the dosing devices, please consult the corresponding device manuals.

- The diaphragm of a glass electrode must never dry out. The longest service life for electrodes when not in use can be reached if the glass shaft is stored in the electrolyte. To do this, the protective cover is filled to about half-way with electrolyte and pushed onto the glass shaft of the electrode.
- The glass electrodes are frost-resistant to approx. -15°C; if the temperature falls below this value, the electrodes must be stored in a frost-safe environment.
- If condensation moisture can be expected at the installation site, the device must be supplied with continuous voltage in order to protect the electronics. Alternatively, the device may be dismounted and stored in a dry location.
- If frost is expected at the installation site, all water-conveying parts, such as measuring water pipes and measuring cell, must be emptied completely.

8.3 Disposal of used parts and operating materials

Clean dismounted, contaminated parts thoroughly first and dispose of them, or have them recycled, in accordance with the regulations applicable at the operating location. Observe the relevant instructions on the packaging for the operating materials. In case of doubt, information may be obtained from the authorities responsible for disposal at your location.
If this is not possible, dispose of the parts/substances as hazardous waste.

9 Documents

9.1 Declaration of conformity

See operating instructions Part 1 regarding the respective dosing device.

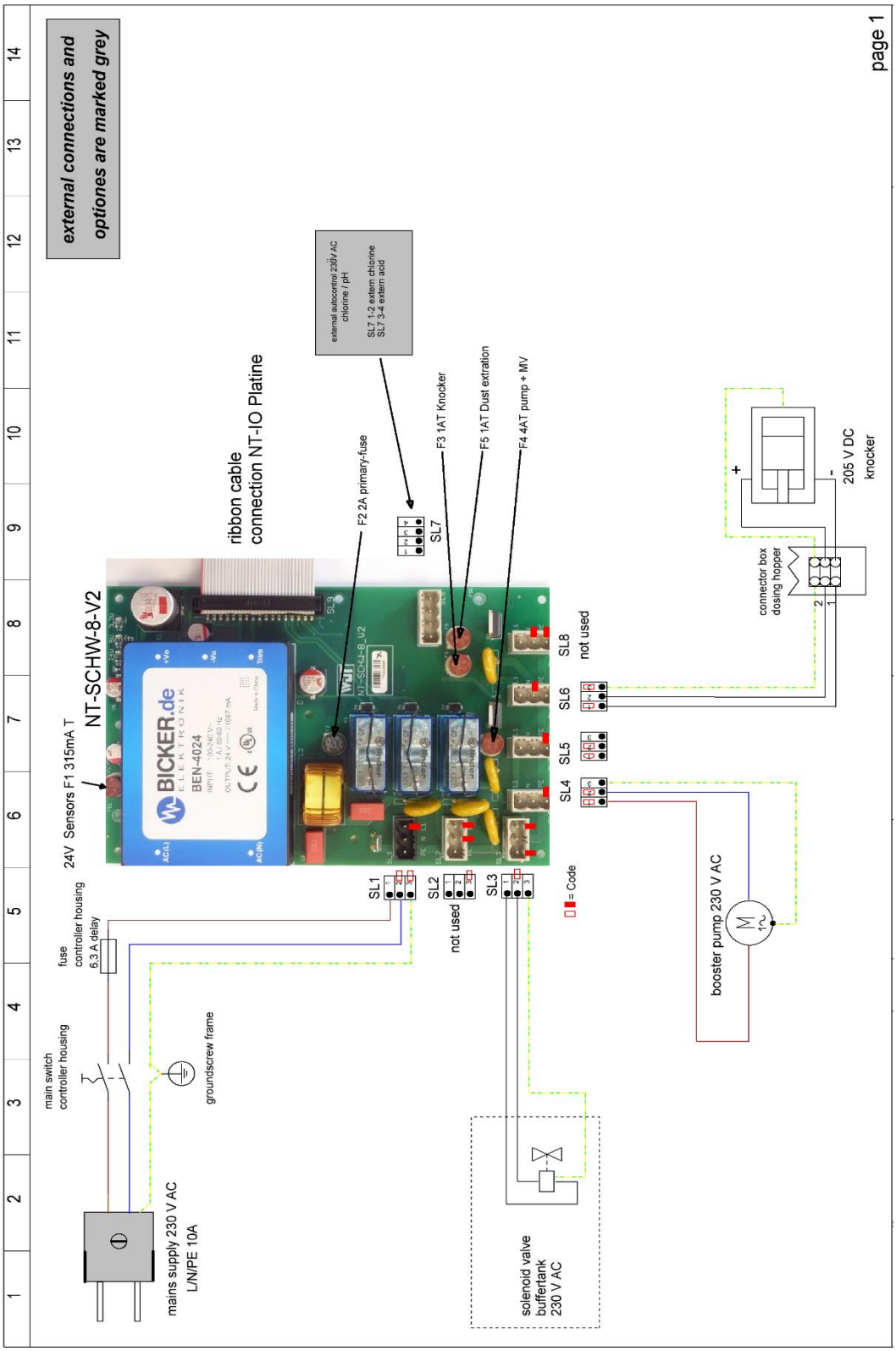
- **for Granudos 10 Touch, Nr.: BA SW 002**
- **for Granudos 45/100 Touch, Nr.: BA SW 003**

9.2 Wiring diagrams

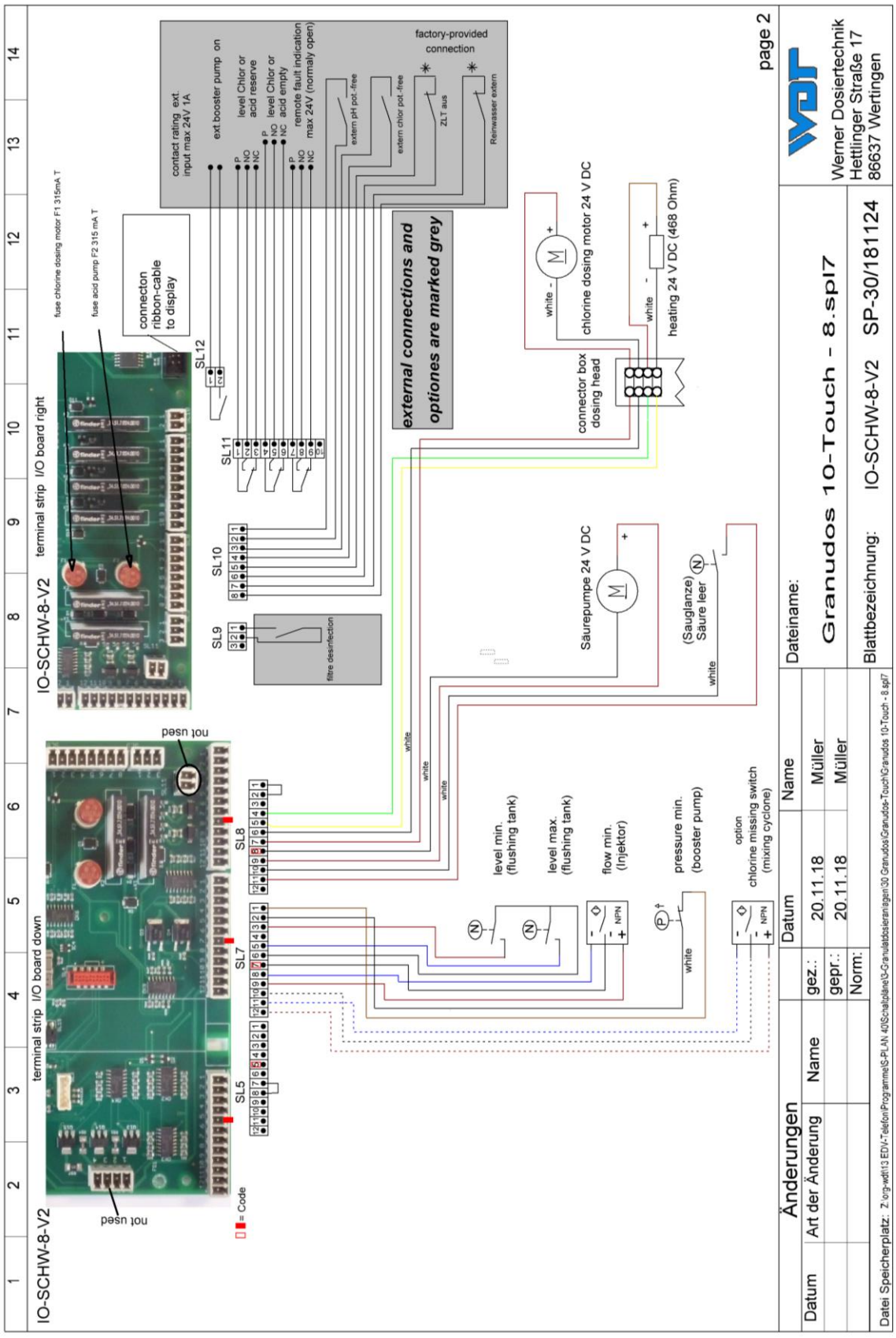
DANGER!

Risk of death due to high voltage. All electrical work on the device must only be carried out by trained specialists in accordance with the applicable safety regulations! Internal fuses must only be replaced once the voltage has been disconnected and secured against being reactivated!

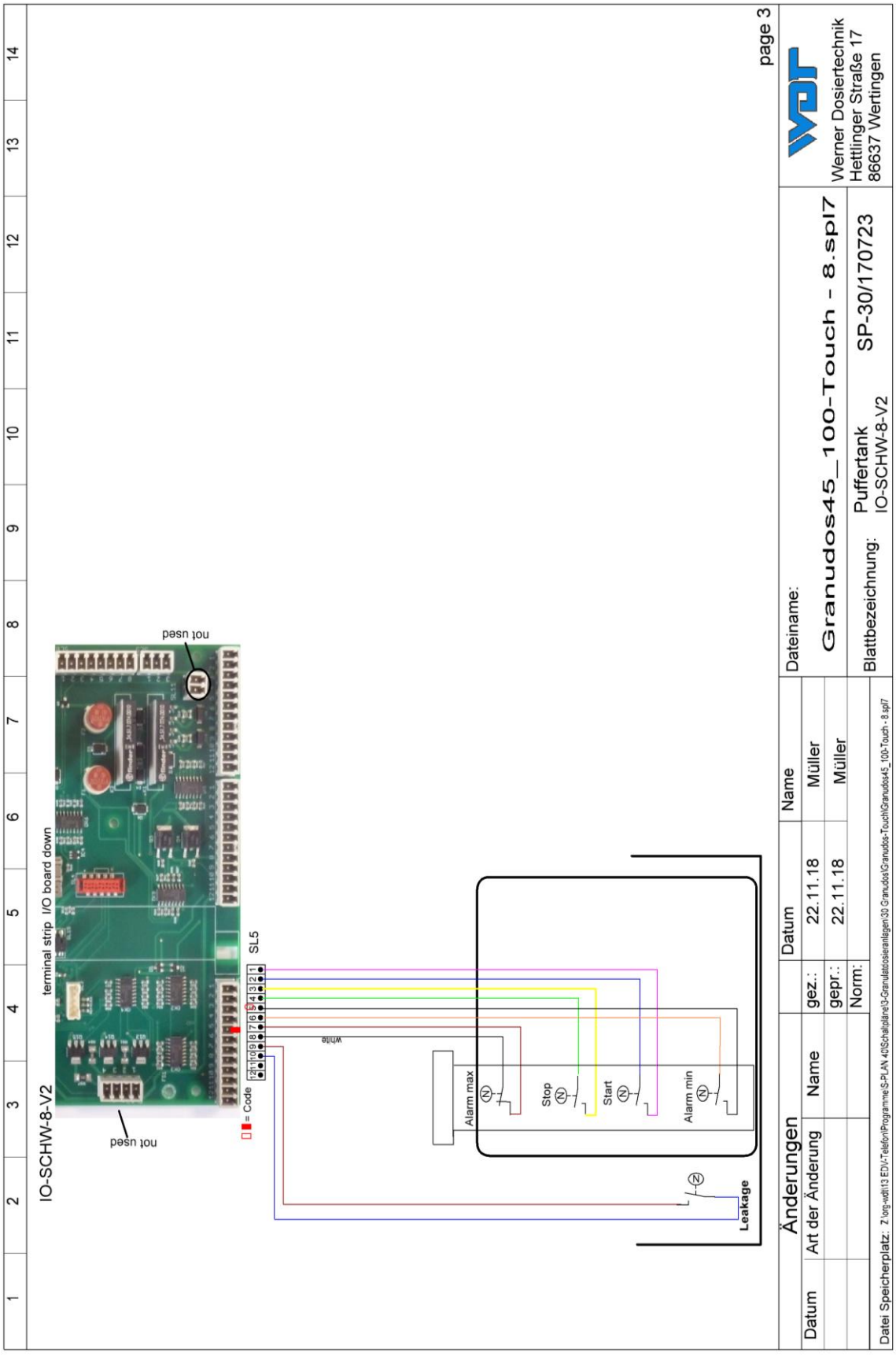
9.2.1 Wiring Diagram Power pack **Granudos 45/100** and **Granudos 10**



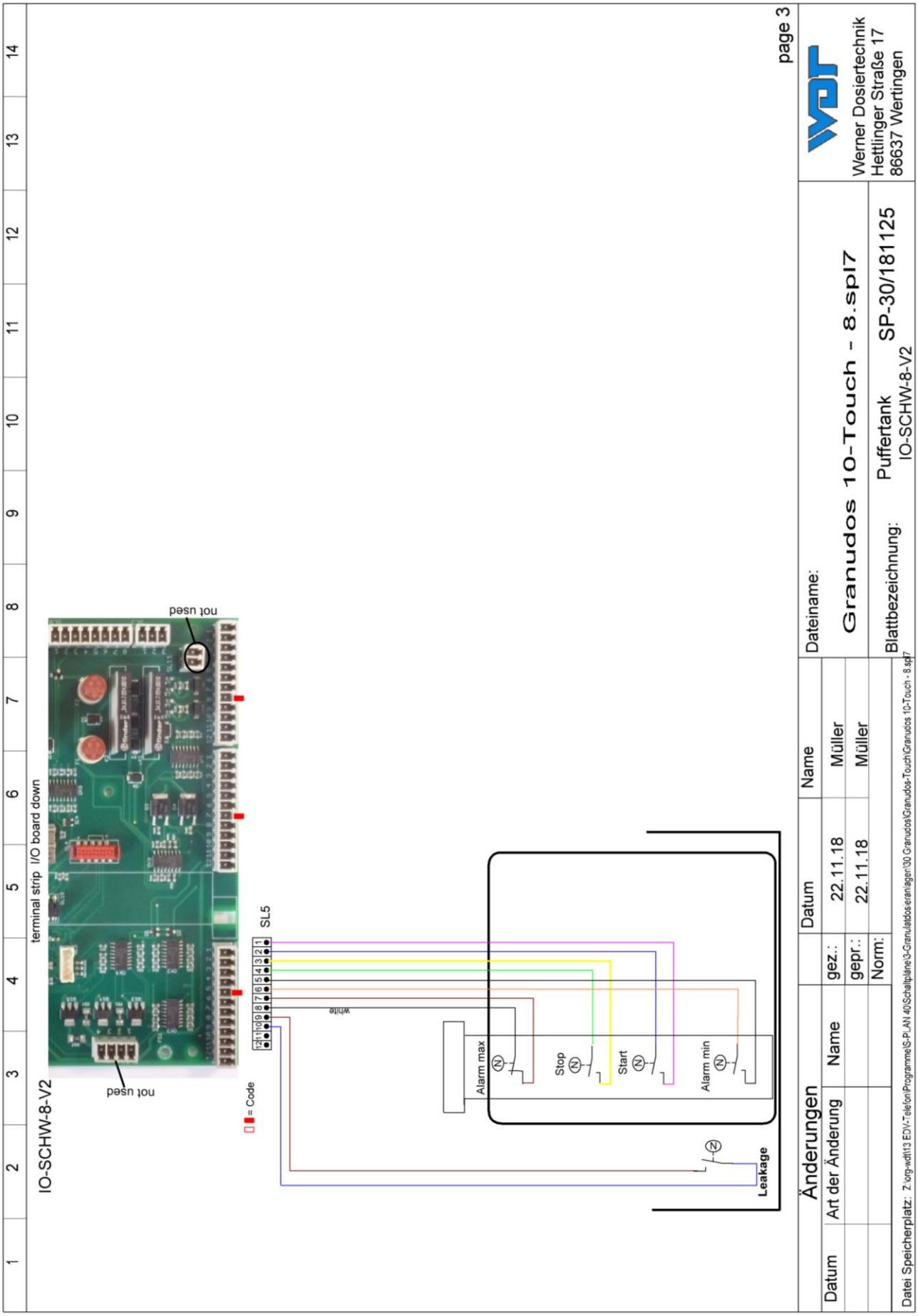
9.2.2 Wiring diagram I/O board **GRANUDOS 10**



9.2.3 Wiring diagramm Buffer tank **GRANUDOS 45/100**



9.2.4 Wiring diagram buffer tank **GRANUDOS 10**



9.3 Commissioning protocol

See operating instructions Part 1 Dosing technology, regarding the respective dosing device.

9.4 Operation data sheet

During a *"firmware update,"* all parameters are reset to the factory setting. After an "update," all parameters must therefore be checked and readjusted to the basin. We therefore recommend that you enter the optimised, basin-specific parameters in this list.
In addition, the electrodes must be calibrated after a *"firmware update!"*

Settings menu	Factory setting	Setting ranges	Step	during commissioning	Optimised during operation
1 Dosing performance pH/acid				Date:	Date:
Acid	8 seconds	1-8 seconds	1		
Chlorine	15 seconds	1-15 seconds	1		
Cycle	30 seconds	30-360 seconds	30		
Dosing time limit acid	0	0-100 minutes	5		
Dosing time limit chlorine	0	0-100 minutes	5		
Manual dosing	Off	Off – On			
2 Reserve indication chlorine					
Reserve message	like order	1-150 kg	1		
container size	like order	1-150 kg	1		
Reserve indication	On	Off - On			
3 Reserve indication acid					
Reserve message after	20l	1-500l	1		
Container size	25l	1-500l	1		
Reserve indication	On	Off - On			
4 Shock cl.					
Dosing performance acid	10%	10-100%	1		
Dosing performance chlorine	50%	0-100%	1		
5 System → Password					
End user	—	0000 – 9999	1		
Technician 1	01234	00000 – 99999	1		
6 System → Display					
Screensaver	20%	12-100%	2		
Delay	00:05	00:00 – 23:59			
Backlight	75%	24 - 100%	2		
7 System → Network					
IP-address	192.168.0.1				
Gateway	192.168.0.0				
Subnet	255.255.255.0				
8 Dust extraction (option)					
Flushing interval	12h	0 – 48h	1		
Flushing time	5 seconds	0 - 5 seconds	1		
Dust extraction	like order	Off – On			
9 Buffer tank (option)					
Dosing performance acid	10%	10 - 100%	1		
Dosing performance chlorine	50%	50 - 100%	1		
Activate buffer tank	like order	Off – On			

10 pH Supervision					
Alarm low	6.8 pH	6.5 – 7.4 pH	0.05		
Alarm high	7.2 pH	6.6 – 7.5 pH	0.05		
Delay time	5 minutes	0 – 60 min			
Activate pH Supervision	like order	Off – On			
11 Delay Booster pump					
Delay time	30 seconds	0 - 120 sec	5		
12 Dosing performance Chlorine granulate					
rpm dosing screw	like order	12 – 60 RPM	1		
Diameter dosing screw	like order	19 / 26mm	1		
13 Dosing performance acid					
Hose diameter	4.8mm	0.8/1.6/3.2/4.8/ext			
14 Maintenance interval					
Maintenance after	365 days	0 – 365 days			

Operation data sheet, –master copy–
Please copy the blank operation data sheet for additional uses

Settings menu	Factory setting	Setting ranges	Step	during commissioning	Optimised during operation
1 Dosing performance pH/acid				Date:	Date:
Acid	8 seconds	1-8 seconds	1		
Chlorine	15 seconds	1-15 seconds	1		
Cycle	30 seconds	30-360 seconds	30		
Dosing time limit acid	0	0-100 minutes	5		
Dosing time limit chlorine	0	0-100 minutes	5		
Manual dosing	Off	Off – On			
2 Reserve indication chlorine					
Reserve message	like order	1-150 kg	1		
Barrel size	like order	1-150 kg	1		
Reserve indication	On	Off - On			
3 Reserve indication acid					
Reserve message after	20l	1-500l	1		
Barrel size	25l	1-500l	1		
Reserve indication	On	Off - On			
4 Shock cl.					
Dosing performance ac	10%	10-100%	1		
Dosing performance cl	50%	0-100%	1		
5 System → Password					
End user	––	0000 – 9999	1		
Technician 1	01234	00000 – 99999	1		
6 System → Display					
Screensaver	20%	12-100%	2		
Delay	00:05	00:00 – 23:59			
Backlight	75%	24 - 100%	2		
7 System → Network					
IP-address	192.168.0.1				
Gateway	192.168.0.0				
Subnet	255.255.255.0				
8 Dust extractionC					
Flushing interval	12h	0 – 48h	1		
Flushing time	5 seconds	0 - 5 seconds	1		
Dust extraction	like order	Off – On			
9 Buffer tank					
Dosing performance ac	10%	10 - 100%	1		
Dosing performance cl	50%	50 - 100%	1		
Activate buffer tank	like order	Off – On			
10 pH Supervision					
Alarm low	6.8 pH	6.5 – 7.4 pH	0.05		
Alarm high	7.2 pH	6.6 – 7.5 pH	0.05		
Delay time	5 minutes	0 – 60 min			
Activate pH Supervision	like order	Off – On			
11 Delay Booster pump					
Delay time	30 seconds	0 - 120 sec	5		

12 Dosing performance Chlorine granulate					
rpm dosing screw	like order	12 – 60 RPM	1		
Diameter dosing screw	like order	19 / 26mm	1		
13 Dosing performance acid					
Hose diameter	4.8mm	0.8/1.6/3.2/4.8/ext			
14 Maintenance interval					
Maintenance after	365 days	0 – 365 days			

9.5 Maintenance protocol

See operating instructions Part 1 Dosing technology, regarding the respective dosing device.

9.6 Spare parts list, wear parts list, consumables

The spare parts and wear parts listed in the following are available through your specialist supplier. Please always include the exact product designation and the device serial number with you orders. The device serial number can be found on the control casing. Wearing parts are excluded from the 2-year warranty. For these we assume a warranty of 1/2 year.

Spare parts

Wear parts

Device part		**Designation**	**Item no.**
Electrodes		pH electrode gel with plastic shaft	12437-1
		Electrolyte 5 ml for overwintering	15945
		Buffer solution ph4 50 ml	10383
		Buffer solution ph7 50 ml	10384
		Electrode cleaner - diaphragm cleaner 50 ml	11962
		Electrode flushing liquid 500 ml	11963

Consumables
Please comply with the chemicals manufacturer's safety data sheets!

10 Appendices

Personal notes
You can use the following lines for personal notes, e.g., regarding conducted service tasks or special versions, extensions or device modifications.